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the requirements of the public. This is particularly so in regions where natural gas has been used. Gas is more convenient, more economical and safer to use than any other fuel. There are in nature three potential sources of raw materials adequate for the production of a future domestic supply of manufactured gas. These three potential sources are bituminous shale, oil and coal. Artificial gas, as produced on a commercial scale, consists of the following varieties: Shale gas, oil gas, producer gas, water gas, carburetted water gas, coal and coke oven gas. The manufacture of a domestic supply of water gas, enriched with natural gas, serves two purposes—(1) It conserves in the highest possible manner our natural resources of coal, oil and gas and (2) it insures to the public an adequate supply at all times of a clean, uniform gas at the lowest possible cost. Natural gas companies should no longer be permitted to sell natural gas as such at ridiculously low rates but should be required to utilize it in the highest possible way, viz.: as a means of enriching artificial gas. Such use of this natural resource will insure to the public, for many years to come, a supply of gas at a cost otherwise impossible.

*The commercial realization of low temperature carbonization:* DR. HARRY A. CURTIS. The carbocoal process for converting bituminous coal into a uniform, smokeless fuel resembling anthracite was developed by the International Coal Products Corporation at its experimental plant in Irvington, N. J. Both small apparatus and commercial size units have been in use there for the past four years, and there has been an opportunity to compare the results obtained in laboratory tests with those of plant operation. In the carbocoal process the crushed coal is carbonized first at a low temperature ( $900^{\circ}$  F.), the resulting semi-coke is then ground and briquetted with pitch. The briquets are finally carbonized at somewhat below coke-oven temperature ( $1800^{\circ}$  F.). The resulting fuel, carbocoal, is hard, dense, smokeless, and free-burning. More than a hundred coals, including a wide range of bituminous coals and lignites, have been tried in the process, and apparently any coal can be used successfully. Construction of the commercial plant at Clinchfield, Va., was begun during the war as a government war project. It was finally completed and put into operation in June, 1920. Its capacity is between five and six hundred tons of raw coal per day. (Lantern slides showing construction of commercial plant, yields of by-products, etc.)

*Fuel conservation, present and future:* HORACE C. PORTER.

*Some factors affecting the sulfur content of coke and gas in the carbonization of coal:* ALFRED R. POWELL.

*The distribution of the forms of sulfur in the coal bed:* H. F. YANCEY and THOMAS FRASER. A study has been made of the quantitative distribution of the forms of sulfur, namely pyritic and organic sulfur, in coal as it occurs in the various sections or benches of the seam. About 120 samples were collected at twenty working places in three mines, one operating in the number six seam in southern Illinois, one in the number nine and the other in the number twelve bed in western Kentucky. At each face the seam was divided into from four to eight benches and was represented by a corresponding number of samples. Some of the samples were taken at places in the bed which showed the coal intergrown and interbedded with lenses, bands, and cat-faces of pyrite. The purpose of the work was to determine if a relation exists between pyritic and organic sulfur, and in case segregations or concentrations of organic sulfur were found to exist, to associate such occurrences with other impurities or specific recognizable conditions. The data secured indicate no definite and absolute relationship between quantitative amounts of pyritic and organic sulfur in a given bed or sample. Samples taken at five faces in one mine indicate, in the majority of instances, that an increase in pyritic sulfur is accompanied by a decrease in organic sulfur. This is not uniformly true and the data do not warrant any such generalization, except to say that high pyritic sulfur and visible segregations of iron pyrite are not indicative of high organic sulfur content.

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